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ABSTRACT

This practicum was designed to train inexperienced teachers in the basics of computer technology, multimedia, authoring, and networking. The goals were to enable teachers with access to computers in the educational setting for the first time to utilize this technology as an instructional strategy and as a management tool. Six teachers were selected, four with classroom computer mini labs, two without, to meet in six weekly sessions to participate in training. Training took place on both Macintosh and IBM platforms. Each teacher included computer technology in a unit of instruction and began to use computers for management purposes. Analysis of the resulting data showed that all objectives were achieved, and all six teachers are actively working with technology. The training sessions attracted the attention of administrators and fellow teachers who are exploring ways to begin using technology. Appendices provide technology skills inventory and evaluation of unit of instruction forms and an outline of the 6-week training program. (Contains 34 references.) (Author/AEF)

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ED 382 189

Technology as an Academic Tool in a Rural High School

by

Jean Curran

National Cluster 62

A Practicum I Report Presented to the
Ed.D. Program in Child and Youth Studies
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Education

NOVA SOUTHEASTERN UNIVERSITY

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This practicum took place as described.

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This practicum report was submitted by Jean A. Curran under the direction of the adviser listed below. It was submitted to the Ed. D. Program in Child and Youth Studies and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova University.

Approved:

February 18, 1995
Date of Final Approval of Report

Roberta Silfen, Ed.D., Adviser

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ABSTRACT

Technology as an Academic Tool in a Rural High School. Curran, Jean A., 1995: Practicum Report, Nova University, Ed. D. Educational Technology/Staff Development/Rural Education/Inservice Training.

This practicum was designed to train inexperienced teachers in the basics of computer technology, multimedia, authoring, and networking. The goals were to enable teachers with access to computers in the educational setting for the first time to utilize this technology as an instructional strategy and as a management tool.

The writer selected six teachers, four with classroom computer mini labs, two without, to meet in six weekly sessions to participate in training. Training took place on both Macintosh and IBM platforms. Another six weeks were spent implementing the training received. Each teacher included computer technology in a unit of instruction and began to use computers for management purposes.

Analysis of the resulting data showed that all objectives were achieved, and all six teachers are actively working with technology. The training sessions attracted the attention of administrators and fellow teachers who are exploring ways to begin using technology.

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CHAPTER I

INTRODUCTION

Description of Community

The school where this practicum was conducted is the only high school in a small, rural county in the south, located about 60 miles north of the state capital. The population of the county is approximately 16,000, and the school system is its largest employer with over 400 employees on the payroll. The remainder of the employment opportunities within the county boundaries include a few small factories and small retail and service-oriented businesses. Many local people commute to distant locations to work; Lockheed Corporation some forty miles away is a major employer of county workers. Chicken farms and small cattle farms account for the agricultural interests.

The dearth of employment opportunities affects the student population in three primary ways. First, a majority of the parents are stuck in low-wage jobs and can offer their children few economic advantages. To provide themselves with cars and better clothes many of the high school students work and thereby undermine their own educational success. Second, job opportunities for the students

after graduation are the same low-paying positions their parents fill; a majority of graduates are forced to leave the county to find adequate employment. Finally, the meager tax base affects the quality of the school itself putting constraints on the curriculum and and the facilities.

Two mountain retirement communities located within the county give the rural population a larger than usual professional contingent boasting of artists, published writers and a variety of personalities who add interest to the community and serve as resource people for the schools.

Writer's Work Setting and Role

Besides the high school, the local school system is made up of two elementary schools and one middle school. The high school student population is approximately 750, 98.2 percent of whom are white, 1.5 percent are African-American, .15 are Hispanic and .15 are Asian. The average Scholastic Aptitude Test scores of the students consistently exceed the state average in both math and verbal skills.

There are 59 certificated staff members at the high school. A 10 percent salary supplement enacted eight years ago along with the unhurried lifestyle and the beauty of the mountains that surround

the community keep the teaching staff relatively stable. On the other hand, the school has had four principals in the past seven years.

When computers were first introduced into the high school about 10 years ago, they entered by way of the vocational program. Typing classes gave way to keyboarding. Computer literacy, word processing, and desktop publishing all became functions of the vocational department. The academic departments were never furnished with more than one or two computers, and they were usually used for classroom management. The only computer-aided instruction that existed in the school prior to the current school year is found in the Success Program conducted in one classroom under the sponsorship of the vocational department.

The writer has been a school media specialist for 23 years; the last 15 years have been served in the present location. Eight years ago the writer initiated a seven-day SAT preparation workshop for high school sophomores that is still the only formal SAT preparation the students receive. The writer was also the only teacher in a group of three educators who, under the sponsorship of a Partners for Educational Excellence Program, designed and developed a partnership with a local college to increase post secondary education and training. This partnership, in turn, forged a strong relationship

with the business community of the county that carries over into all areas of school life.

One other factor figures largely in the opportunities and outlook for education in this rural school. In 1993 a state lottery was initiated to aid education. It was decided at the state level that large amounts of the supplementary money would be used to build an infrastructure for the utilization of educational technology in schools across the state.

Consequently, during the opening months of the 1994-1995 school year each of the four schools received a satellite dish, funds for a fully automated and networked media center, and enough computers to put together individual classroom mini labs or one multipurpose lab large enough to accommodate an entire class. In addition, the high school was informed in mid-June that it would be granted a $100,000 two-way interactive video system to be installed early in the new school year. In December this system was in place.

CHAPTER II

STUDY OF THE PROBLEM

Problem Description

Within the space of three months the writer's high school acquired 17 new computers, some of them the most advanced machines available when they were ordered. The school technology plan, designed in early 1994, called for a classroom mini lab in each of the four major academic departments. The language, social studies and science teachers had labs consisting of one teacher workstation and two student stations; the mathematics teacher began the school year with one teacher station and six student stations. All teachers in the school had access to a developing multimedia station. As the school year began evidence showed that both students and teachers had had limited experience with computers. If the new equipment was to benefit the school program, students and faculty needed to acquire the skills to operate computers, judge and use software programs and make appropriate use of other kinds of technological tools in a short time.

The state provided three levels of training for teachers who found themselves without technology skills, but these training

centers could not offer the intensive training needed by schools in their regions, nor could they guide the day-to-day progress in the school and be ultimately responsible for the technology program within individual schools. In neighboring school systems this in-house guidance was provided by a system-wide technology coordinator, but the local system had no such position.

The problem, then, was that the school would have high-end computers and other sophisticated technologies, but their teaching staff was technologically inexperienced.

Problem Documentation

The teachers' limited experience with technology as the school year began was revealed by a teacher survey (see Table 1) designed for the purpose by the writer. The survey disclosed the following:

1. Of 33 teachers surveyed, 10 could not operate a computer.
2. Fewer than 10 teachers had experience with drawing, painting, database, spreadsheet and communication.
3. Local area networking experience was claimed by only seven teachers, and wide area networking by only three.
4. Twenty-four teachers had no experience with multimedia.
5. Only nine teachers had used software to help with grading procedures; 30 teachers had never used authoring software.

6. Only six teachers had used live television or satellite to aid instruction.

In a survey of 521 students (see Table 2), 216 said that none of their teachers used computers in the classroom.

A floor plan showing the distribution of the 97 computers in the school at that time (see Table 3) reveals that 77 were in the vocational wing, five were in the media center, and six were in the offices. Only nine computers were located in academic classrooms.

Accumulated evidence clearly indicates that a majority of teachers had little or no experience with technology, and a large number of the students never encountered technology at school.

Causative Analysis

One did not need to look far to find the causes of the faculty's lack of technological experience. The evidence shows that the school possessed few computers outside the vocational department. Ten to 12 years ago when the state allocated funds for technology, it was believed that computers belonged in classes devoted to typing skills and computer programming. When an applied technology lab and a drafting program were introduced into the curriculum, they, too, fit into vocational programming.

Table 1

TECHNOLOGY SURVEY
A survey distributed to 50 teachers, 33 responding

I. Computers are the basis for most new technologies.
Can you operate a computer? Yes_23___ No_10___
If yes:
IBM platform_15___
Apple (Macintosh)_13___
What processes have you used?
Word processing_22___
Drawing__9__
Painting__6__
Database__9__
Spreadsheet_7___
Communication_7___

II. Networking is soon to become a tool for use in this school.
Are you familiar with networking?
Local area? Yes_7__ No_26__
Novell_2__
Lantastic_1__
Other__2_
Wide area? Yes_3___ No_23___
Internet__4_
EduNet__2_
Other__2__

III. Multimedia offers many opportunities for effective educational use.
Have you used multimedia? Yes_9___ No_24___
Computer with camera_3___
Computer with CD ROM__9__
Computer with laser disk_1___
Computer with LCD panel__5__
Any other combination of above__0__

IV. The computer opens the door to many useful procedures.
Have you used a computer as an aid to instruction? Yes_20___ No_13___
Have you used grading software? Yes_9___ No_24___
Have you used authoring software? Yes_3___ No_30___
Have you used HyperCard? Yes_4___ No _29___

V. Distance learning is a final category of technology that is to be made available in this school.
Have you taken a course for credit by television? Yes_2___ No_31___
By satellite? Yes____ No_33___
Have you used live television or satellite transmission to aid instruction? Yes_6___ No_27___
Have you taken part in a teleconference? Yes_5___ No_28___

Table 2

Student Survey

1. Do you have a computer in your home? Yes 185 No 336

   If so...

   a. Do you use it often ? Yes 103 No 82

   b. Do you use it for (please circle one or more)
      1. Games, first choice
      2. Word processor, third choice
      3. Extra help for school, second choice
      4. Other (Please specify)
         Accounting, balancing checkbook, art work, work/related

2. Do any of your teachers use computers in your classes?
   Yes 305 No 216

   If not...

   a. If you had access to a computer at school, would you be willing to learn how use it? Yes 215 No 17

   b. Do you think it could help you in school? Yes 210 No 16

   If so...

   a. Do you personally have access to a computer often in your class? Yes 184 No 147

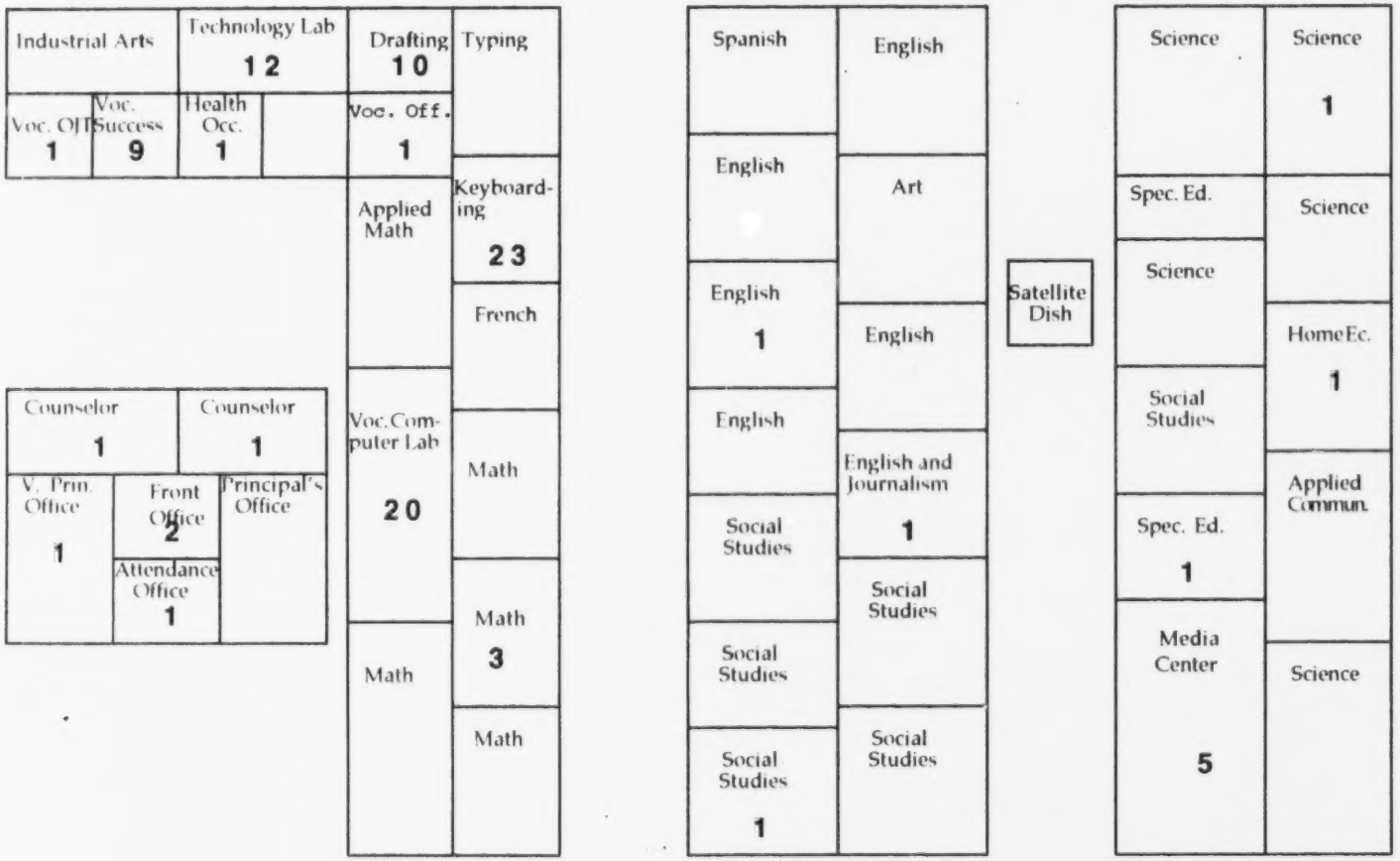
   b. Do you think that you learned (please circle one) more (first choice), the same (second choice), or less (third choice) than you would have without the use of computers?

3. If you could choose between computer programs to use in your classroom, what types of programs do you think would be most helpful to you?

Math	Games
English	Data base
Lotus	Tutorial
Word Perfect	Accounting
Job finding	Prodigy
Geography	Interactive
Spreadsheets	Biology
DOS	Encyclopedia
Word processing	Windows
History	Autosketch
Programming Language	Modems

Table 3

Computers at the High School, Dec., 1993 Total - 97



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The one or two computers placed in academic departments were not enough to stimulate any interest in computers or any of the other emerging technologies that had applications in education. No funds were allocated for software. The few computers in the media center to handle circulation and inventory chores and some reference functions created no great interest among the faculty because there were not enough to have impact on classroom instruction. Teacher training on computers was left up to individual teachers to handle on their own.

Neither the lack of technology nor any interest in acquiring technological equipment had been expressed at faculty meetings or board meetings over the prior three years.

In a rural system, where supplies and up-to-date materials are usually scarce, students, teachers and administrators often become resigned to making do with whatever is at hand and learn to expect little in the way of innovative materials. Since rural schools are more isolated than urban schools, the teachers and students seldom encounter colleagues or fellow students in other systems who have access to more up-to-date teaching and learning aids. People, even educators, do not miss something they have never had.

Relationship of the Problem to the Literature

There is no shortage of technology literature. Technology is touted as a solution to the restructuring that is needed to significantly improve education throughout the country (Fulton,1993; Newman, 1992; Sheingold, 1991; Wiburg, 1989). Opinions as to possible educational applications of technology abound.

The failure of educational systems to provide their teachers with the proper training even when the computers have been supplied is a familiar theme in recent literature. Fulton (1993), quoting a report by the American Association of Colleges for Teacher Education, stated that only 29% of education students graduating from college in 1987 felt comfortable using computers as classroom aids. D'Ignazio (1990) accused education of building "dirt roads" instead of the electronic highways now traveled by businesses (p. 633). A number of technology writers have cited lack of teacher training as an important reason why educational technology has not had the success that many proponents of technology had expected (Albright & Graf, 1992; Bulkeley, 1988; Hancock & Betts, 1994; Marshall, 1990).

In a probing report for the Office of Educational Research and Improvement in 1987, Kenneth Komoski found the problem to be more complex than mere lack of training for teachers. He took the

education establishment to task for relying on "prepackaged" materials of every variety from textbooks to integrated learning systems (p.18). He urged educators to recapture the control over their curricula that they abandoned to publishers of textbooks and related materials. Only then, in his opinion, can technology be effectively used in the classroom.

Skolnik, Larson & Smith (1993) pointed out that the amount of money that systems normally set aside for technology staff development is usually inadequate. They found that, though the amounts of money allocated by systems for this purpose ranged all the way from five percent to 75 percent, most systems fall in the lower percentages giving their technology programs only marginal support.

In a general study of reform in rural school systems, Smith and Lotven (1992) found that instability of leadership, teaching out-of-field, lower salaries and budgets, limited curriculum and high drop out rates have stymied efforts at reform. Haas (1990) and DeYoung and Howley (1990) blamed many of rural America's education problems on consolidation while Lewis (1992) called rural public schools "an invisible minority" (p. 660).

CHAPTER III

ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS

Goals and Expectations

The following goals and outcomes were projected for this practicum. The four teachers who received classroom computer mini labs and two other teachers representing the remainder of the faculty would become competent users of at least one form of computer-based technology affecting student learning. It was also expected that each of the six teachers would begin to use computers to assist in their classroom management. It was further expected that the faculty as a whole would be encouraged to begin using the newer technologies currently available in the school.

Expected Outcomes

It was the intention of the writer to achieve the following outcomes:

Objective I: At the end of 12 weeks, each of the six teachers would demonstrate increased technological skills by planning and implementing one unit of instruction using some new form of technology.

Objective 2: At the end of 12 weeks, each of the six teachers would demonstrate the value of the computer as a teacher's aid by using it for some classroom management function.

Objective 3: At the end of 12 weeks, the six teachers would promote the further use of technology in the school by sharing their experiences in technology with the entire faculty.

Measurement of Outcomes

Three instruments were designed by the writer to measure the outcomes of the practicum. A Technology Skills Inventory would act as a pretest and a posttest to measure the gains made by teachers in the target group. An Evaluation of Instruction survey would identify the technology used for instruction, how it was to be used and with what success. It would also include recommendations concerning its use. A short outline of the unit plan of instruction that was to include some technology component was requested of each teacher.

The final instrument was a report to the faculty as a whole on the training process. The report would briefly describe the training the group received and the ways in which they made use of that training. The information would be derived from the training experience and the instruction survey, and the format of the material would follow the regular update format of the school technology

committee. In that way the entire faculty could, to some extent, share in the success or lack of success of the target group of teachers and become familiar with the technology that is available to them at present as well as the technological assistance they can expect in the future.

Chapter IV

SOLUTION STRATEGY

Discussion and Evaluation of Possible Solutions

The problem addressed in this practicum was the inexperience of high school teachers with the up-to-date technology equipment that has recently been acquired by the school for integration into the school curriculum.

The literature of the last three or four years does not reflect the early skepticism of many writers that computers would be a fad or that they would be so misused as to prove worthless in educational settings. The most recent literature--magazines, journals and professional books--has concentrated on the benefits of technology to education and the applications through which those benefits can be realized.

The literature covering technology integration into school curricula is replete with both positive and negative experiences of teachers confronting technology for the first time. There is a consensus, however, that teachers have no choice but to accept the challenges of the information age and start to make use of technology for the educational benefit of their students.

After posing a question concerning the best strategies for gaining competence with computers, Fulton (1993) suggested that "it is a little like how porcupines make love--very slowly and carefully!" (p. 6). Madian (1990) advised tackling technology one step at a time. Judah L. Schwartz, Professor of Education at Harvard, cautioned schools to proceed slowly but steadily as they attempt to improve their curricula by integrating technology (Trotter, 1993). D'Ignazio (1989b) lauded the simple approach to using multimedia, suggesting working with only a few components in the beginning. Brady (1991) found that the major barrier to the use of computers in the classroom has changed from lack of interest or expertise to lack of time, and he, along with Ely (1990), strongly emphasized the need for teachers to have the time to work with technology.

The classroom mini lab approach follows closely the design for a "prototype" classroom recommended by Farley (1993, pp. 32-34). He described the plan by which his system undertook small projects that were more palatable to their community than larger, more expensive programs. The small projects consisted of outfitting a few classrooms in the most advanced equipment. In that way a dramatic impact was made while staying within budget limitations.

The idea of teachers training teachers is a popular one. McCarthy (1988) reported that in Portland, Oregon teachers with

experience in technology use in the classroom are teaching other teachers and are able to offer course credit at a local university. Grubb and Gonzales (1990) described a California effort to reform the teaching of literature by first training a small group of teachers in the basics of a planned program. The original teachers became facilitators in staff development efforts across the entire state. The program eventually became the California Educational Telecommunications Network (ETN), an "electronic staff development distribution system using both satellite transmitted live and interactive in-service programming" (p. 56).

Of special benefit to the teachers in California was the immediate availability of help and the opportunities for easy follow-up. Trotter (1993) encouraged school systems to follow up formal training with in-house training and develop the position of a resident technology consultant. Marshall (1990) described a study conducted by graduate students who found that training by software company representatives was conducted too rapidly to be of much use to teachers. Anderson (1990-1991) expressed the belief that teachers will handle technology integration more successfully if resources, including instruction, are stored and disseminated at the school or district level.

Kinnaman (1990) presented a step-by-step plan for building a staff development backbone for a school system utilizing the concept of teachers training teachers. He would begin with a system-wide technology coordinator who would train a small group of teachers to become technology experts in their own schools and conduct their schools' training. He advocated not only group learning sessions for teachers, but one-on-one follow-up to workshop activities. He stated his belief that in-house staff development is the most efficient and cost effective method of training teachers to use technology.

Word processing is generally cited as the most popular application for computer use by teachers (Madian, 1990). The prevailing route to technology integration into the curriculum is by way of multimedia. Part of the reason for the growing popularity of multimedia, according to D'Ignazio (1989b), is its staying power. Because multimedia is a combination of many types of media, able to be accessed at different levels of expertise and for a variety of uses, it will not lose its allure as some innovations have. William Gates, founder of Microsoft Corporation (1993), commented that multimedia enables a teacher to deliver a lesson using "the best possible medium" for delivery (p. 36). Gates, among others, also pointed out that multimedia is fun. Howles and Pettengill (1993) outlined a seven-step plan for building a lesson around multimedia.

D'Ignazio (1989a) printed a practical set of instructions for connecting various combinations of media.

Eventually teachers attempting technology integration must confront networking in both local and wide areas. Kinnaman (1991) suggested that computers must be connected together to make the most of computer technology. Harasim (1990) stressed the social aspect of networking. Whereas working with a personal computer is a solitary activity, when computers are networked, the experience can involve groups of people. Harasim continued pointing to the advantages of networking describing it as time and place independent giving students a 24-hour learning environment that can range over the world. Kinnaman (1991) described many of the technical procedures involved in networking, and Riel (1992) and Martinelli-Zaun (1993) listed techniques for developing school projects by way of computer networks.

The notion that technology integration should be a slow deliberate process has merit in the opinion of the writer. It can enable foundations to be laid giving teachers time to become knowledgeable and comfortable with merging technologies. However, many times individual schools and school systems are bombarded with large amounts of unfamiliar equipment and must deal with it at once. The watching public is not always

understanding or patient in its assessment of teachers' methods. In addition, when state departments issue guidelines as to the use of state funds, there are often time lines involved. For these reasons, it is not always possible for faculties to take the time to become comfortable with an innovation. This is the case in the writer's school setting.

On the other hand, teachers training teachers is a workable solution for a faculty with few discretionary resources but with large amounts of technology to learn to manage in a short space of time. The writer's school has no available technology coordinator as suggested by Kinnaman (1990), but media specialists have been given much of the responsibility for planning for technology within the local schools. Consequently, the writer should be able to fill this requirement. The use of a media specialist as a trainer of technology has the added benefit of putting the technology expert in the school giving teachers immediate access and making follow-up practicable.

Word processing is the basis of computer work, and this is the area in which the greatest number of teachers within the high school have had experience. There are a number of ways in which word processing skills can aid local teachers in and outside the classroom. Multimedia, which may be as simple as using a computer with a

built-in CD-ROM and will be available in the writer's school, likewise, is a logical basic step to technology training as an aid to instruction.

Basic training in local area networking is necessary in a school where the media center is automated and networked. Wide area networking is more demanding, but since the capacity will exist within the school, the foundation could be laid for future exploration and development.

Description of Selected Solution

The literature was helpful to the writer in putting together a plan that fit the present circumstances of the work setting. The writer would train a small group of teachers in the basics of several technological processes that they would then begin to use in their classroom work. The writer chose for the target group the four teachers with the mini labs as well as two other teachers who would represent the faculty without classroom labs but who would have access to a stand-alone Macintosh with multimedia capabilities as well as two IBM compatibles in the media center. The four participants with labs represented the major academic departments and will be able to pass on instruction to members of their departments and share their equipment through a room exchange process. The two remaining teachers would demonstrate to

the faculty as a whole what technology is currently available to them. Six teachers would form a manageable group to receive training.

Instruction in word processing on both Macintosh and IBM platforms was to constitute the basic computer training. With a good foundation in word processing the teachers could begin immediately to make use of utilitarian programs to manage their instructional duties and engage their students in the use of computers to enhance learning. Multimedia and networking would give the group access to processes that can be used in the classroom by both teacher and student.

All of the above training administered by this writer would follow the highly recommended strategy of teachers training teachers, training which can eventually permeate the school.

Report of Action Taken

In October, 1994 approval to begin the implementation of the solution strategies outlined in the proposal of this practicum was granted. Permission to conduct the project had already been given by the principal, and six teachers had agreed to receive the training. One of the rooms containing three Macintosh computers, was chosen for the training site; three additional computers, two IBM

compatibles and one Macintosh, were wheeled into the classroom from the media center. ClarisWorks and MicrosoftWorks were the programs used.

Some of the teachers had requested that they be granted a staff development unit for the training. Since the amount of training time would fit into the 10-hour requirement for staff development units, permission was granted by the system staff development coordinator. A 12-week schedule was planned, and implementation began in October.

The first weekly session was dedicated to a thorough grounding in the basics of word processing. Each of the six teachers had some experience with word processing, but real training was spotty. Some teachers were self-taught. Every part of the opening screen and most of the menu options were discussed and manipulated. The writer believed that attention to small details in the beginning would instill the confidence the teachers needed to tackle more complex technologies in order to make the most effective use of their computers. Mastering the hanging indention, for example, was particularly satisfying to the group.

The second session involved more advanced techniques such as the various approaches to columns and their uses in newsletters, the use of the built-in outlining function and many of the ways objects

can be manipulated and effectively used with and without text. The first two sessions taken together formed the foundation for all that followed.

The third session was particularly important because it enabled the teachers to embrace the electronic gradebook, and it presented the technique for merging text with database, both useful skills for any teacher. A grading procedure using only a spreadsheet function served to introduce spreadsheet features and uses. A grading program, ClassMaster, created for Macintosh users, was also introduced. ClassMaster utilizes both spreadsheet and database functions and led naturally into further database uses in education. The group created a data base of addresses that could be used as both printed labels for envelopes and inside addresses in correspondence. After keying in a hypothetical letter to parents, the group was able to merge the addresses from the database with the letter created in word processing. Since only one computer was connected to a printer, one teacher executed the final step of printing the letter.

The fourth session served as an introduction to two valuable skills. The writer created and displayed on a television screen a slide show and a HyperCard program. All the members of the group working with Macintoshes were able to create and run their own

slide shows. The complexities of HyperCard and ToolBook made it impossible to do more than introduce some of the aspects of authoring such as working on two layers and creating buttons for maneuvering. The purpose of this part of the session was to demonstrate the power of authoring programs and some of their uses to educators. It was not intended that anyone master either program because such skills require many hours of concentrated work.

In session five the group moved to another classroom to see a demonstration of a scanner and then went to the media center to learn how to connect a computer to a large screen television for classroom presentations. The versatility and relative ease of use of multimedia was discussed.

Session six, involving networks, was conducted without the use of actual networks since the school's modem and local-area-network have not yet been installed. But the group was introduced to terminology and basic procedures in local area networks, and a handout composed of all the printed screens of a trip on the Internet worked well as an introduction to cyberspace travel. The group was shown the e-mail process, the procedure for entering a distant university library and locating one of its books, and what is available in the fun and games area. This session was postponed until the last

week of implementation in the hope that the school network would be operational.

The remaining six weeks were spent by the group in utilizing their training in various ways. Some problems with the new equipment developed along the way, but were quickly corrected. Each member was given a copy of Vicki Blum Cohen's "What Is Instructionally Effective Microcomputer Software?" (1983), and individual discussions were held concerning software purchases. The interactive video distance learning lab proved to be the perfect place to conduct classes using the computer and large screen television for various types of classroom presentations. Two teachers have already made use of this multimedia technique with their classes. Both teachers and students were able to interact with the programs used.

The last session also presented an opportunity to administer the posttest and gather data on the ways in which the teachers used the technology and training.

CHAPTER V

RESULTS, DISCUSSION, AND RECOMMENDATIONS

Results

The problem addressed by this practicum was overcoming teachers' inexperience with technology in order to take advantage of newly acquired computers and computer accessories. Four teachers received classroom mini labs as a result of the state lottery proceeds poured into education. These teachers had only slight knowledge of computers, and only two had used them in the classroom to run programs. The goal, then, was to enable each of these teachers to begin making use of their computers for classroom management as well as for an aid to teaching.

Two teachers who did not receive mini labs were included in the study group to represent the balance of the faculty who were in the same situation. The objective was to determine to what extent the faculty not yet fortunate enough to have computers in their classrooms could still begin to use computer technology. These teachers were encouraged to use one of the computers made available to them by the media center.

Objective 1: It was predicted that the teachers would demonstrate their new skills in technology by planning and implementing a unit of instruction using some form of technology. All six of the teachers succeeded in using technology in at least one unit of instruction. Two used more than one technological technique. Objective one was met. Table 4 lists the instructional units devised by each teacher in the focus group.

Table 4

Units of Instruction Using Technology

Teacher	Unit of Instruction	Result	Future Use
Science	Simulations in lab on cellular respiration	Could manipulate variables	Yes
Social Studies	* Used multimedia encyclopedia to spark interest in research	"System worked well"	Yes
French	* Used a CD ROM program on language listening skills using television monitor	"Excellent"	Yes
English	Students created script from Stranger in a Strange Land and filmed it using computer enhancements	"Very positive for motivation"	Yes

Units of Instruction Using Technology (continued)

Study Skills	Individualized a student's math program	Worked well	Yes
Math	Used computers to introduce, teach and drill on fractions	"Worked very nicely"	Yes

*Used multimedia center in distance learning center

Objective 2: It was expected that each teacher would use the new technology in some form of classroom management. Five of the six are now using either ClassMaster or a gradebook using a simple spreadsheet format. The sixth is a study skills teacher who does not give grades. Word processing skills are now used regularly by all six. The following table illustrates the gains made by the six teachers.

Table 5

Technology Skills Inventory
A Comparison of Pretest and Posttest Results

	Pretest Yes Answers	Posttest Yes Answers
Word Processing		
Create a document	6	6
Open a document	6	6
Save a document	6	6
Print a document	6	6
Edit a document	1	6

Technology Skills Inventory
A Comparison of Pretest and Posttest (continued)

	Pretest Yes Answers	Posttest Yes Answers
Put text in columns	2	5
Create an outline	1	5
Graphics		
Use draw tools	3	6
Select and deselect objects	3	6
Duplicate objects	2	5
Move objects	2	6
Color objects	3	5
Group and Ungroup objects	1	5
Combine objects with text	1	5
Spreadsheet		
Enter data into cells	2	6
Enter data into columns	1	6
Enter data into rows	1	6
Move cells, columns, and rows	0	5
Use formulas	0	6
Display data in charts	0	5
Database		
Design a database	0	5
Use fields	1	6
Enter records	1	5
Sort records	0	5
Advanced strategies		
Create slide show	1	4
Merge data with text	1	4
Work with shortcuts	0	4
Use local area networks	0	2

Technology Skills Inventory
A Comparison of Pretest and Posttest (continued)

	Pretest Yes Answers	Posttest Yes Answers
Understand and work with security rights	0	1
Connect with a wide-area network	0	1
Maneuver on the Internet	0	2
Capture data from Internet	0	2

Objective 3: It was expected that a report would be made to the entire high school faculty to inform them of progress made by fellow teachers in the use of technology and the possibilities that this use opens up to the whole faculty. A report would also serve as a regular update to the faculty on the school technology plan. The report (see Appendix C) was drafted and distributed to the faculty at the end of the 12-week implementation period. The report outlined the training and implementation that the focus group experienced and emphasized those activities that are possible to any faculty member. The use of available computers in the media center with personal disks make it possible for any faculty member to create a computerized gradebook and to average grades faster and more efficiently. There is also a multimedia station available in the media center which may be used by any teacher. These facilities have

successfully included the entire faculty in the technology acquisitions.

Discussion

The data collected and the evidence analyzed demonstrate that the objectives of this practicum were accomplished. The situation in which new equipment sits by unused does not exist in the school under study. On the contrary, all six teachers are enthusiastic and are continually stretching their abilities. Likewise, a number of other teachers have shown an interest in using more technology. The interest level has been high since the beginning of the school year. The writer believes this is due, in great part, to the immediate attention given to staff development needs of the faculty. The results of this practicum compare favorably with a similar project conducted by Standish (1993) in which she found that such staff development in the area of technology demonstrably raised the confidence level of teachers thereby encouraging greater use of computers and related technology.

The use by some of the six teachers of various forms of multimedia such as a computer combined with large screen television for using CD ROM programming is an effective beginning step toward all the other accessories available to be used with a

computer, and some of the students of those teachers are already enjoying the benefits of interactive programs. The science teacher in the focus group found the funds to invest in a scanner and is now using that technology to enhance her classroom computer use.

Considerable interest has been shown in the Internet and the possibilities it offers to classroom instruction. Mastering the basics of computer use has given these six teachers the confidence to try any technology that promises classroom benefits. Of particular importance has been the interest of other faculty in the project. The art teacher has already enlisted the aid of the writer in a training program to increase her computer competence, and other teachers have expressed an interest in grading procedures and networking advantages.

During the 12-week implementation period the writer was approached by an administrator about the possibility of conducting other in-house training sessions giving credibility to the efficacy of the teachers training teachers concept espoused by Grubb and Gonzales (1990) and McCarthy (1988).

The governor and school superintendent of the state are presently studying a plan to fund at least a half-position for every school in the state to carry out just such training activities as that covered by this practicum. Should this position become funded and

in-house technology training become policy, the writer's school will have a head start.

Recommendations

1. It is clear that in-house technology training is definitely beneficial in building teachers' confidence in their ability to use technology. It is recommended, therefore, that this strategy be suggested to the school technology committee for inclusion in its staff development plans for the entire faculty.

2. It is further recommended that the concept of school technology specialist in some form be embraced by the school whether or not the state mandates such action.

3. The writer finally recommends that periodic surveys of the faculty be conducted to ascertain needs that can be filled through in-house training.

Dissemination

It is the plan of the writer to furnish copies of this report to each member of the system technology committee as well as the school superintendent and the board of education.

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APPENDICES

APPENDIX A
TECHNOLOGY SKILLS INVENTORY

Technology Skills Inventory

Date _____

Can you-----
- Create a document? _____
- Open a document? _____
- Save a document? _____
- Print a document? _____
- Edit a document?
  - Cut, copy and paste? _____
  - Tabulate? _____
  - Format?
    - Font? _____
    - Size? _____
    - Style? _____
    - Space? _____
  - Check spelling? _____
- Put text into columns? _____
- Create an outline? _____

Can you-----
- Use draw tools? _____
- Select and deselect objects? _____
- Duplicate objects? _____
- Move objects? _____
- Color objects? _____
- Group and ungroup objects? _____
- Combine objects with text? _____

Can you-----
- Enter data into--
  - Cells? _____
  - Columns? _____
  - Rows? _____
- Move cells, columns and rows? _____
- Use formulas? _____
- Display data in charts? _____

Can you-----
- Design a database? _____
  - Use fields? _____
  - Enter records? _____
  - Sort records? _____

Can you-----
- Create a slide show? _____
- Merge data with text? _____
- Work with shortcuts? _____
- Use local area networks? ___
- Understand and work with security rights? _____
- Connect with a wide-area network? _____
- Maneuver on the Internet? _____
- Capture data from wide-area networks? _____

APPENDIX B
EVALUATION OF UNIT OF INSTRUCTION

Evaluation of Unit of Instruction

1. Subject of unit _____

2. Multimedia configuration employed _____

_____

3. How was the technology used? _____

_____

_____

4. Evaluate the use of the multimedia and its impact on student learning?

_____

_____

_____

5. Would you use the technology strategy again? _____

6. Describe the changes, if any, that you would make in its use. _____

_____

_____

7. Describe any plans you may have for future use of multimedia. _____

_____

_____

APPENDIX C
TECHNOLOGY TRAINING AND IMPLEMENTATION FOR SIX TEACHERS

TECHNOLOGY TRAINING AND IMPLEMENTATION
FOR SIX TEACHERS

The following is a plan developed to provide training for the effective integration of technology into the classroom instruction and classroom management of four teachers who received computer mini labs and two teachers who represented the balance of the faculty who did not receive computers. The plan had three objectives:

1. The first objective predicted that teachers would implement a unit of instruction using some new technology.
2. Objective two promised that teachers would begin to use technology in managing classroom paperwork.
3. Objective three required that these efforts be shared with the entire faculty.

Six weekly after-school sessions covered the following areas:

Week 1: Word processing (ClarisWorks, MicrosoftWorks)

Opening screens

Working with documents, files, folders/directories

Managing text (fonts, formats and style)

Editing strategies (moving text, using tools)

Saving and printing

Week 2: Advanced word processing and graphics

Creating columns

Outlining

Creating and moving graphics

Week 3: Data processing and spreadsheets

Mail merge

Grade book utilities

Week 4: Hypertext

Week 5: Multimedia

Week 6: Networking (local and wide area)

The following six weeks were spent applying the training techniques. The six teachers would like to share with you the results of this training program and the implications it has for the faculty as a whole.

Each teacher used technology in some form with students as demonstrated by the following table:

Table 1

Units of Instruction using Technology

Teacher	Unit of Instruction	Result	Future Use
Science	Simulations in lab on cellular respiration	Could manipulate variables	Yes

Units of Instruction using Technology (continued)

Teacher	Unit of Instruction	Result	Future Use
Social Studies	* Used multimedia encyclopedia to spark interest in research	"System worked well"	Yes
French	* Used a CD ROM program on language listening skills using television monitor	"Excellent"	Yes
English	Students created script from Stranger in a Strange Land and filmed it using computer enhancements	"Very positive for motivation"	Yes
Study Skills	Individualized a student's math program	Worked well	Yes
Math	Used computers to introduce, teach and drill on fractions	"Worked very nicely"	Yes

*Used multimedia center in distance learning room

Please note that two of the teachers used interactive programs with the multimedia center located in the distance learning room. Programs on either floppy disk or CD ROM may be used with the Power Macintosh and projected to the large screen of the television monitor; this teaching technique is available to the entire faculty.

All of the teachers in the group who work with grades are now using some form of computerized gradebook. The teachers with Macintoshes are using ClassMaster, a gradebook program designed especially for the Macintosh. The teacher with the IBM compatible has a gradebook created on a spreadsheet program in MicrosoftWorks. The one teacher who works with grades and does not have a classroom computer is using ClassMaster copied to a floppy disk and using the Macintosh in the distance learning room. Any teacher who wishes to do so may develop a gradebook on a floppy disk using either ClassMaster or spreadsheet with computers available in the media center and distance learning room.

Three of the six teachers are receiving one SDU each for participating in this training. In-house training can garner staff development units if it follows the regular guidelines for SDU's. We believe this experimental training program holds many implications for the further use of technology within our school. We hope that you will find ways to make use of our new technology.